

COLLECTING STACK PARTICULATE FILTER AND CHARCOAL CARTRIDGE SAMPLES

Purpose This Meteorology and Air Quality Group (MAQ) procedure describes the process to collect particulate filters and charcoal cartridge samples, deliver the samples to the analysis laboratory, and maintain proper sample chain-of-custody.

Scope This procedure applies to the collection of particulate filter and charcoal cartridge samples from sampled stacks at Los Alamos National Laboratory (LANL) as part of the Rad-NESHAP Project. The collection of filters from sampled stacks at the Los Alamos Neutron Science Center is not covered by this procedure.

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Hazard Control Plan The hazard evaluation associated with this work is documented in Attachment 1: Initial risk = **low**. Residual risk = **low**. Work permits required: none. First authorization review date is one year from group leader signature below; subsequent authorizations are on file in the group office.
NOTE: This work authorization applies only to MAQ personnel. Supervisors of personnel in other groups are responsible for authorizing work for their employees.

Signatures
(continued on
next page)

Prepared by: <div style="text-align: center;">(signed)</div> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <div style="text-align: center;">Debra Archuleta, MAQ</div>	Date: <div style="text-align: center;"><u>12/19/2003</u></div>
Work authorized by: <div style="text-align: center;">(signed)</div> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <div style="text-align: center;">Jean Dewart, MAQ Group Leader</div>	Date: <div style="text-align: center;"><u>12/19/2003</u></div>

12/19/03

CONTROLLED DOCUMENT

This copy is uncontrolled if no red stamp is present on printed copies.
Users are responsible for ensuring they work to the latest approved revision.

General information about this procedure

Signatures, *continued*

Approved by: (signed) _____ Dave Fuehne, RAD-NESHAP Project Leader	Date: <u>12/19/2003</u>
Approved by: (signed) _____ Terry Morgan, Quality Assurance Officer	Date: <u>12/19/2003</u>

Attachments

This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Hazard Control Plan	2
2	Stack Sample Data Form and Chain-of-Custody Record	1
3	Stack Sample Data Form and Chain-of-Custody Record for Unscheduled Sample Collection	1
4	Memo to Analytical Laboratory	2
5	Memo to Shipping Department	1
6	Filter Clumping Strategy	2
7	Chain-of-Custody and Screening Data for Shipping Weekly Stack Samples	2

History of revision *(continued on next page)*

Revision	Date	Description Of Changes
0	03/29/96	New document.
1	12/16/96	Revised to include inspection of sampler "O" ring, changes in group management, and worker safety.
2	02/06/98	Revised to include blank filters and wording changes.
3	02/19/98	Revisions to include CMR procedural requirements.
4	6/2/00	Added HCP as attachment 1, removed list of stacks, and made wording changes throughout.
5	3/13/2001	Changed sequence of steps in filter and charcoal collection, modified "Stack Sample Data Form" to include System Inspection Checklist.
6	8/2/01	Revised purpose wording to include chain of custody, added reference to form, added steps on receiving custody of samples back from HPAL.
7	3/29/02	Added steps on donning and removing gloves during survey for activity, added step to sign for custody when receiving samples from HPAL at TA-55, added documentation of compliance with DOT regulations, and added attachment 5 on "clumping" of samples for gamma spectroscopy analysis.

General information, continued

History of revision (continued)	Revision	Date	Description Of Changes
	8	6/4/02	Update details of several steps and modify step on surveying filters with radiation survey instrument.
	9	12/22/03	Updated to reflect use of new off-site analytical laboratory.

Who requires training to this procedure? The following personnel require training before implementing this procedure:

- MAQ technicians, MAQ staff members, and HSR-1 Radiation Control Technicians (RCTs) assigned to perform all or part of this procedure
- HSR-1 RCTs who may need to perform unscheduled sample collections

Training method The training method for this procedure is **on-the-job** training by a previously trained employee and is documented in accordance with the procedure for training (MAQ-024).

Annual retraining is required and will be by self-study (“reading”) training.

Prerequisites In addition to training to this procedure, the following training is also required before performing this procedure:

- Radiological Worker training
- Facility-specific requirements for each facility

A “Q” level security clearance is also required for some facilities.

Definitions specific to this procedure PPE: Personnel Protective Equipment is equipment used to protect the individual from becoming contaminated from hazardous or radioactive material during an operation.

Fibrous side of filter: The glass-fiber particulate filters used for stack sampling have a very smooth side and a coarse side having visible glass fibers. The coarse side is considered the “fibrous” side.

References The following documents are referenced in this procedure:

- MAQ-024, “Personnel Training”
- MAQ-026, “Deficiency Reporting and Correcting”
- MAQ-124, “Compositing Stack Sample Filters”
- MAQ-601, “Collecting & Processing Stack Air Particulate and Vapor Samples from TA-53”
- MAQ-SOW-07, “Statement of Work for Gamma Spectroscopy of Stack Charcoal and Particulate Filter Samples”

Background and overview of stack filter change

Background The Environmental Protection Agency's National Emission Standard for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities, 40 CFR 61, Subpart H (NESHAP) and facility-specific requirements (e.g., TSRs and OSRs) require sampling for various radionuclides from several LANL facilities. Included in these requirements is the need to sample stack emissions for particulate and vapor radioactive materials. Most facilities at LANL that work with radioactive materials have the potential to emit particulate material emissions. As such, particulate sampling is the most common stack sampling conducted at LANL. Glass fiber filters are used for this sampling.

A small number of facilities at LANL also have the potential to emit vapor emissions. These emissions are not readily collected on filter paper so a charcoal-sampling cartridge is used in series with the filter paper to collect these radionuclides, where applicable.

Overview of filter change This procedure describes the four processes required to perform the sample change:

- preparing forms, sample filters, and charcoal cartridges
- removing and replacing sample filters and charcoal cartridges
- delivering the samples to an analytical laboratory
- completing the required documentation

Frequency of filter change A stack-sampling period is normally a one-week, 7-day period. The start and end times of the period are determined by the actual time of sample filter and/or charcoal cartridge change. A trained MAQ technician or staff member changes the filters, normally each week. Extra change cycles may be necessary as part of maintenance or test activities.

After an extended holiday, samples may be changed on the morning of the next working day, if the facility and the Rad-NESHAP Project Leader agree. Other sample change schedules may be arranged for extended holiday periods to meet facility needs.

Worker safety

Performing work safely

DO NOT perform work under conditions you consider unsafe. Before beginning work described in this procedure, review safety needs and requirements, identify hazards, and develop hazard mitigation measures. Be aware that facility configurations and hazards may change between visits. Hazards to assess include, but are not limited to the following:

Rotating machinery and electrical equipment - Work described in this procedure is performed in the vicinity of fans, motors, and other facility equipment. Do not work in the vicinity of exposed conductors or if guards are not in place on operating facility equipment.

Radiological hazards - Stack sampling locations are often radiologically controlled. Be sure to comply with all facility-specific PPE requirements before entering controlled areas.

Roofs and scaffolding - Work described in this procedure will take place on roofs and/or scaffolding. **Fall protection equipment must be used if the performance of work requires personnel to be within 6 feet of the edge of a 6-foot or greater drop.** Additional safety precautions and equipment must be considered, and when appropriate, used to minimize the risks of injury resulting from falling equipment, lightning strikes, exposure, and other potential hazards. Safety precautions to be considered related to working at heights include:

- Use of hard-hats
- Observing safe ladder practices
- Delaying work because of dangerous weather conditions

DO NOT work on roofs and/or outdoor scaffolding during lightning storms or when lightning storms are in the area.

Facility management units - Work control is the responsibility of the Facility Manager. Obtain approval from facility management before beginning work described in this procedure. Ensure you have completed all facility-specific training requirements (see prerequisite training requirements on page 2).

Transportation requirements

Transport of Class 7 (Radioactive) materials is regulated according to 49CFR173, Subpart I. According to this regulation, material with a specific activity of less than 2 nanocuries per gram are NOT considered radioactive material for transportation or shipping purposes, and special handling is not necessary.

Note that if the samples fall within the activity threshold criteria specified in the chapter *Particulate Filter and Charcoal Cartridge Collection*, step #19, then historical data shows that they will also be within the DOT limits.

Particulate filter and charcoal cartridge preparation

Overview Before sample filters and charcoal cartridges may be changed, filter, cartridges, and required documentation must be prepared. The materials listed below must be collected and used during the preparation process.

Required materials Collect the following materials:

- Hollingsworth and Vose Company LB-5211-A0 (or equivalent) glass-fiber filter media filters
- Hi-Q Environmental Products Company catalog number TC-12 (or equivalent) analytical carbon cartridges
- glassine envelopes
- small ziploc bags
- medium ziploc bags
- large ziploc bags
- Stack Sample Data Form and Chain-of-Custody Record (Attachment 2)
- Clipboard
- plastic sample box for transporting required materials in the field

Steps to prepare filters and cartridges Prepare the glass-fiber filters and charcoal cartridges, in accordance with the following steps:

Step	Action
1	Prepare a Stack Sample Data Form and Chain-of-Custody Record (Attachment 2) for each filter and the filter clump (see Attachment 6) by placing a bar code sticker on the form and recording the sampling facility identification (TA, Bldg., ES).
2	Label the back (fibrous side) of the new glass-fiber filter for each sampled stack with the location (TA, Bldg., ES) and the sampling (xx/yy – xx/yy) period dates.
3	Label one (1) trip blank “75000101” and record the dates of the sampling period on the filter.
4	Label a single filter as a matrix blank filter, “75000103,” and record the dates of the sampling period on the filter.
5	Label the side of a new charcoal cartridge for each applicable stack with the location (TA, Bldg., ES) and the sampling-period dates.
6	Place each filter in a clean glassine envelope. Place all glassine envelopes for the single filters and clumps in new small ziploc bags.
7	Place each charcoal cartridge with a new small ziploc bag.

Steps continued on next page.

Particulate filter and charcoal cartridge preparation, cont.

Step	Action
8	Separate the cartridges, by site, in medium Ziploc bags.
9	Place small ziploc bags containing glassine envelopes and the medium ziploc bags containing charcoal cartridges into a larger ziploc bag.
10	Secure the Stack Sample Data Form and Chain-of-Custody-Record (Attachment 2) to the clipboard.
11	Place the bag containing the filters, charcoal cartridges, and the clipboard holding the forms into the plastic sample box.

Particulate filter and charcoal cartridge collection

Overview A trained **MAQ technician, MAQ staff member, or HSR-1 RCT** normally changes the filters and charcoal cartridges on a weekly (7 day interval) basis. However, different cycles may be necessary as part of maintenance or test activities. Before collecting samples, collect the equipment listed below.

Equipment and materials required for collecting samples A plastic sample box, containing the following materials will be used in the field for collecting filters and cartridges:

- prepared glass-fiber filters
- prepared charcoal cartridges
- Stack Sample Data Form and Chain of Custody Records for field data
- small ziploc bags
- medium Ziploc bags
- large ziploc bags
- disposable gloves
- tweezers
- three spare Parker part number 142 (or equivalent), 2.362 in. inside diameter “O” rings (for filter holders)
- three spare Hi-Q Environmental Products Company part number 9455-K21 (or equivalent) gaskets and part number 9452K96 (or equivalent) “O” rings (for charcoal cartridge holders)

Carry a portable gross alpha/gross beta survey instrument in the government vehicle when collecting samples. When collecting samples from the CMR building (except Wing 9), hand carry the portable gross alpha/gross beta survey instrument in the building.

Steps to exchange filters To change a glass-fiber filter and/or charcoal cartridge, perform the following steps:

Step	Action
1	When entering a facility, address all facility-specific sign-in, dosimetry and notification requirements. NOTE: Before continuing with sample collection activities, see the chapter <i>Worker safety</i> and review safety needs and requirements. <u>DO NOT</u> perform work under conditions you consider unsafe.
2	Put on a pair of disposable gloves when handling stack samples at any point during collection and survey. Disposable gloves are the minimum required PPE for performing sample filter and charcoal cartridge changes. Facilities may have additional PPE requirements for facility access.

Steps continued on next page.

Particulate filter and charcoal cartridge collection, cont.

Step	Action
3	Verify visual and sound of sampling system is normal.
4	If a charcoal cartridge is to be changed, open the cartridge holder. If there is no charcoal cartridge on the system, proceed to Step 10.
5	Remove the charcoal cartridge and place it in the small ziploc bag.
6	Insert this ziploc bag, containing the cartridge, into the medium ziploc bag.
7	Examine the charcoal cartridge holder for the presence of, and condition of, the flat gasket and “O” ring and replace the gasket and/or “O” ring if it is missing, damaged, or deteriorated.
8	Place the new charcoal cartridge in the holder ensuring that the cartridge is aligned according to the flow direction arrow on the side of the cartridge.
9	Reconnect the charcoal cartridge holder and hand-tighten the assembly.
10	Open the stack filter holder.
11	Remove glass fiber filter and insert into glassine envelope/ziploc bag.
12	Place the new glass-fiber filter in the filter holder with the fibrous, labeled side toward the vacuum source. NOTE: This arrangement should be used although standard practice is to place the fibrous side toward the flow stream. LANL has developed depth-of-burial factors for these filters with the fibrous side toward the vacuum source that warrants this arrangement.
13	Reassemble the sample filter holder and hand-tighten.
14	Record the stop date/time and the <i>sample period</i> start date/time on the Stack Sample Data Form and Chain-of-Custody Record (Attachment 2) for the removed filter and charcoal cartridge and the new filter and charcoal cartridge. NOTE: Written documentation of this step may be performed after returning to vehicle, if desired.
15	Upon completion of filter and cartridge replacement, verify operation of the sampling system. Verify that the sample flow is within the allowable range for the system by checking the rotometer reading against the range provided by the Rad-NESHAP Project Leader. If the stack is equipped with a flow indicator, verify the stack flow reading against the desired range provided by the Rad-NESHAP Project Leader. If the sample system condition or the stack sample flow rates are unsatisfactory, record a description of the problem in the “Remarks” column and notify the facility manager. If the system is in the CMR building, notify the CMR Operations Center.

Steps continued on next page.

Particulate filter and charcoal cartridge collection, cont.

Step	Action
16	Go to the next sampling site at this facility and repeat steps 1 -- 15.
17	When exiting a facility after collecting samples and installing new filters/cartridges, address all facility-specific sign-out and notification requirements.
18	Keep the vehicle locked, even behind security fence areas, when filters are stored inside.
19	<p>When returning to the government vehicle after collecting the filters from CMR Wing 9 or any facility other than CMR Wings 2, 3, 4, 5, or 7, survey the outside of each stack sample with the portable gross-survey instrument.</p> <p>After collecting filters from CMR Wings 2, 3, 4, 5, or 7 and before leaving the wing where the filters were collected, survey the outside of each filter using either the portable gross-survey instrument or a survey instrument inside the facility.</p> <ul style="list-style-type: none"> • If the gross <i>alpha</i> count is greater than 5,000 counts per minute, or if the gross <i>beta</i> count is greater than 50,000 counts per minute, place the stack sample in a separate ziploc bag to prevent cross contaminating the other stack samples. Call an HSR-1 RCT for a more thorough counting. Contact Team Leader for guidance. • If the gross <i>alpha</i> count is 5,000 counts per minute or less and the gross <i>beta</i> count is 50,000 counts per minute or less, isolating stack sample is not necessary to continue with sample collection.
20	After collecting the filters from all sampling systems at the CMR Building, leave a copy of the Stack Sample Data Form and Chain-of-Custody Record for field data containing the current reading of sampling system airflow acceptable ranges with the CMR Operations Center before leaving the facility.
21	Follow the instructions in the next chapter of this procedure to deliver the samples to an analytical laboratory.

TA-55 Sample pickup

At TA-55, these sample exchange steps are performed by HSR-1 Radiological Control Technicians, and placed in a lock box at TA-55 PF-3 Room 163. MAQ employees pick up samples from this location and include them in the shipment described in the next chapter.

Delivering particulate filter samples for shipping

Overview

Deliver the collected particulate glass-fiber filter samples to the shipping group to be sent to an analytical laboratory for analysis. An analytical laboratory requires 'Chain of Custody and Screening Data for Shipping Weekly Stack Samples' and a memo to the laboratory detailing what they will receive and analyses requirements. A second memo is written to the shipping department showing maximum activity in nanocuries/gram of sample, net weight (attachment 5) for all particulate sample filters.

Delivery to analytical laboratory

To deliver the samples for analysis, perform the following steps.

Step	Action
1	Prior to submittal, prepare the documents listed below: <ul style="list-style-type: none"> • 'Chain of Custody and Screening Data for Shipping Weekly Stack Samples' (Attachment 7, generated by the RADAIR database) • Memo to the Analytical Laboratory (attachment 4) • Memo to the shipping department. (Attachment 5) • Express shipping request, available on the LANL web site via the MAQ Group Office.
2	Label large ziplock bags: one for samples and one for paper work.
3	Prior to submittal, ensure all filters are present and grouped properly (see Attachment 6 or a revised clumping strategy, if applicable).
4	On the Chain of Custody and Screening Data for Shipping Weekly Stack Sample form (Attachment 7), there is a Sample Shipping V&V: When all samples are checked, initial and date form.
5	Print name, sign, and record the date and time on the Chain of Custody and Screening Data for Shipping Weekly Stack Sample form.
6	Transfer the samples to shipping department at SM-30.
7	Prepare Federal Express shipping box. Have SUP-3 personnel make copies of all documents to accompany samples.
8	Place samples in shipping box. Place original documents in ziplock bag then into shipping box. Seal box and hand off to SUP-3 personnel. Pick up will be by Federal Express.

Delivering charcoal cartridge samples to TA-53

Overview Deliver the collected charcoal cartridge samples to TA-53-Building 3, TOFI area, for storage.

At the time of delivery, log the samples into logbook in the locked cabinet.

Delivery for storage Perform the following steps when delivering the samples for storage TA-53 , building 3 , room TOFI :

Step	Action
1	Print name, sign, and record the date and time in the log book and the Stack Sample Data Form and Chain-of-Custody Records. Transfer custody of the charcoal cartridges samples to locked cabinet. Keep the Stack Sample Data Form and Chain-of-Custody Records for MAQ's records.
2	Seal large Ziploc bag of samples with custody tape and place it in the locked cabinet in TOFI, TA-53-Bldg 3.

Shipping charcoal samples The charcoal samples typically are collected on a Thursday and shipped with LANSCE samples collected and shipped on the following Tuesday. See procedure MAQ-601 for the shipping details. If for some reason these samples are shipped without the LANSCE samples, see the next chapter.

Delivering charcoal samples for shipping

Transferring the samples to SUP-3 At desired delivery time, transfer chain of custody to SUP-3 for delivery to the analytical laboratory, by Federal Express.

Step	Action
1	Print name, sign, and record the date and time in the log book in TOFI that samples are being transferred from the locked cabinet to the HSR-1 source room, Bldg 395, room 101.
2	Chain of Custody and Screening Data for Shipping Weekly Stack Samples must be checked off and initialed and dated to show that all samples shown on that page were placed in the shipping container.
3	A SUP-3 employee meets at the HSR-1 source room in Bldg 395, room 101 to sign and accept chain of custody of the samples from MAQ personnel.
4	Make copies of all paperwork. Place the the original memo to the analytical lab and the chain of custody forms are in a large Ziploc bag to be included in the shipment.
5	Give the original shipping request and memo to SUP to SUP-3 for the shipment of the samples.
6	SUP-3 packages the samples and paperwork for shipping.
7	HSR-1 surveys the package, documents the reading, and gives one copy to SUP-3 and one to MAQ, keeping original for their own records.

Review of analytical results

The analytical laboratory will send an EDD (electronic data deliverable) of the results to the MAQ analytical chemistry coordinator. The hard copy of the analytical report follows within a couple of weeks. If any unusual isotopes or quantities are observed, investigate the issue to determine if a problem is present.

Unscheduled stack sample collection by an HSR-1 RCT

Overview Unusual circumstances at a facility may require an HSR-1 Radiation Control Technician (RCT) to immediately collect the stack particulate filters and/or charcoal cartridges. Performing the standard collection and documentation process described previously in this procedure may not be possible. These situations must be accommodated, but minimized. Extreme care must be taken to ensure the validity of the samples for demonstrating regulatory compliance.

Unscheduled collection by an RCT For an unscheduled sample collection, perform the following steps:

Step	Action
1	Prepare the new particulate filters and charcoal cartridges by following the steps specified in the <i>Particulate filter and charcoal cartridge preparation</i> chapter of this procedure. Record the sample on the Stack-Sample Data Form and Chain-of-Custody Record for Unscheduled Sample Collection (Attachment 3).
2	Change the samples by following the steps specified in the <i>Particulate filter and charcoal cartridges collection</i> chapter of this procedure (except use Attachment 3 in place of Attachment 2). Record all data on the Stack-Sample Data Form and Chain-of-Custody Record for Unscheduled Sample Collection (Attachment 3). Record the date and time the filter was removed, the date and time the new filter was installed, and the timer reading. Complete the Sample System Inspection checklist.
3	Record the reason for the unscheduled sample collection on the Particulate Stack Sample Data Form and Chain of Custody Record for Unscheduled Sample Collection (Attachment 3).
4	Immediately notify MAQ of the unscheduled sample collection by calling 5-8855. During off-hours, leave a message on voice mail. FAX the completed Stack Sample Data Form and Chain-of-Custody Record for unscheduled sample collection to MAQ at 5-8858.

Records resulting from this procedure

Records

The following records generated as a result of this procedure are to be submitted to the records coordinator **within two months** of generation:

- Stack-Sample Data Form and Chain-of-Custody Record (Attachment 2)
- Stack-Sample Data Form and Chain-of-Custody Record for Unscheduled Sample Collection (Attachment 3), when used
- Chain of Custody and Screening Data for Shipping Weekly Stack Samples(generated by database)
- Express Shipping Document
- Analysis laboratory memo (Attachment 4).
- Particulate stack filter samples radioactivity memo to shipping (Attachment 5).
- Analytical results from the analytical lab are stored in the records room, as they are returned and reviewed.

HAZARD CONTROL PLAN

1. The work to be performed is described in this procedure.

“Collecting Stack Particulate Filter And Charcoal Cartridge Samples”

2. Describe potential hazards associated with the work (use continuation page if needed).

A: Radiological control areas: Personnel must enter radiological areas weekly, where contamination is possible.

B: Ladders: At some facility there are ladders approximately 6’ to 20’ tall. Steps and stairs at other facilities.

C: Roofs: Fall hazards exist while walking on roofs to get near stack where sample is collected.

D: Rotating Machinery: Where samples are collected there is a fan you are close to while removing sample.

E: Weather Conditions: Most samples are outdoors. Conditions such as heavy rains, lightning, snow and ice will make it dangerous to remove samples.

F: Contamination: Filters may contain radioactive particulate matter, and careless handling can result in personnel contamination or cross-contamination between filters.

G: Noise levels: Some sites have machinery and fans with high noise levels.

3. For each hazard, list the likelihood and severity, and the resulting initial risk level (before any work controls are applied, as determined according to LIR300-00-01.0, section 7.2)

A: Radiological control areas: Improbable / moderate = Minimal

B: Ladders: Remote / Catastrophic = Low

C: Roofs: Remote / Catastrophic = Low

D: Rotating Machinery: Remote / Critical = Minimal

E: Weather Conditions: Occasional / Negligible = Minimal

F: Contamination: Occasional / Moderate = Low

G: Noise levels: Occasional / Moderate = Low

Overall *initial* risk: ☐ Minimal ☒ Low ☐ Medium ☐ High

4. Applicable Laboratory, facility, or activity operational requirements directly related to the work:



None



List:

Work Permits required?



No



List:

HAZARD CONTROL PLAN, continued

5. Describe how the hazards listed above will be mitigated (e.g., safety equipment, administrative controls, etc.):

A: Radiological control areas: Access controlled by facility, sign-ins, monitor stations, PPE, RCT support.

B: Ladders: Access controlled by sign-in, review of Regulation fall protection 29CFR1926.500 subpart M. Appropriate hand railings, safety chains and gates.

C: Roofs: Access controlled by sign-in, review of regulation fall protection 29CFR1926.500 subpart M. Stay at least 6' from edge if no railings exist. Barriers are required in places where stack samplers are located less than 6' from edge.

D: Rotating Machinery: Fan motor belts have shields in place as a barrier, personnel/personal safety awareness of area.

E: Weather Conditions: Knowledge of weather on day of sample change. In poor conditions, work will be cancelled until conditions improve.

F: Contamination: use personal protective equipment (e.g., gloves, labcoats) as described in this procedure and as required by facility requirements.

G: Noise levels: Personnel will be in noise area for very short period of time and protection is not required under HSR-5 guidelines. Obey all notices and requirements regarding time limits in noisy areas and using hearing protection. Hearing protection is available and is recommended.

6. Knowledge, skills, abilities, and training necessary to safely perform this work (check one or both):



Group-level orientation (per MAQ-032) and training to this procedure.



Other → See training prerequisites on procedure page 3. Any additional describe here:

7. Any wastes and/or residual materials? (check one) ☒ None ☐ List:

8. Considering the administrative and engineering controls to be used, the *residual* risk level (as determined according to LIR300-00-01.0, section 7.3.3) is (check one):



Minimal



Low



Medium (requires approval by Division Director)

9. Emergency actions to take in event of control failures or abnormal operation (check one):



None



List:

Decontaminate as instructed by HSR-1 RCT.

Perform first aid as necessary and report to HSR-2 or hospital.

Signature of preparer of this HCP: This HCP was prepared by a knowledgeable individual and reviewed in accordance with requirements in LIR 300-00-01 and LIR 300-00-02.

Preparer(s) signature(s)

Name(s) (print)

/Position

Date

Signature by group leader on procedure title page signifies authorization to perform work for personnel properly trained to this procedure. This authorization will be renewed annually and documented in MAQ records. Controlled copies are considered authorized. Work will be performed to controlled copies only. This plan and procedure will be revised according to MAQ-022 and distributed according to MAQ-030.

MAQ, Meteorology and Air Quality Group

Stack Sample Data Form and Chain-of-Custody Record

This form is from MAQ-109

Facility Name:

Analysis Requested: Gross Alpha, Gross Beta, Gamma Spectroscopy

Sample System Inspection

(Place a check (✓) in box to indicate normal operation/conditions. Record sample flow in lpm/units)

Place Barcode
Tracking Sticker Here

Sample Identification TA – Bldg – ES	Date Start	Time Start	Date Stop	Time Stop	Matrix	Container Type	Stack Fan	Sample Flow	Filter House	Sample Line	Stack Con'd	Timer reading	Remarks
					Filter	Glassine Envelope							
					Filter	Glassine Envelope							
					Filter	Glassine Envelope							
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Sample Collector (print and sign) _____

Comments:

Relinquished by (print and sign)	Date Time	Relinquished by (print and sign)	Date Time	Relinquished by (print and sign)	Date Time	Relinquished by (print and sign)	Date Time
Received by (print and sign)		Received by (print and sign)		Received by (print and sign)		Received by (print and sign)	

UNSCHEDULED SAMPLE COLLECTION

MAQ, Meteorology and Air Quality Group

UNSCHEDULED SAMPLE COLLECTION

Stack Sample Data Form and Chain-of-Custody Record

This form is from MAQ-109

Facility Name:							Sample System Inspection						Place Barcode Tracking Sticker Here	
Analysis Requested: Gross Alpha, Gross Beta, Gamma Spectroscopy							(Place a check (✓) in box to indicate normal operation/conditions. Record sample flow in lpm/units)							
Sample Identification TA – Bldg – ES	Date Start	Time Start	Date Stop	Time Stop	Matrix	Container Type	Stack Fan	Sample Flow	Filter House	Sample Line	Stack Con'd	Timer reading	Remarks	
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Risk Reduction & Environmental Stewardship Division

Meteorology & Air Quality Group
PO Box 1663, MS J978
Los Alamos, New Mexico 87545
(505) 665-8855/Fax: (505) 665-8858

Date:
Refer to: RRES-MAQ: 03-

Dr. Ron Chessmore
Stoller Corporation - Grand Junction
2597 B 3/4 Road (Box 14000)
Grand Junction, CO 81503-5504

SAMPLE SHIPMENT - Stack Glass-fiber Filter Weekly samples [complete set R03yyzz]

Dear Dr. Chessmore:

Enclosed with this letter are **25** glass-fiber filter samples for which we require analyses under LANL purchase order number **60379**. Standard turnaround time (per our SOW) is requested. To summarize:

- | | |
|------------------------|--|
| Applicable SOWs | <ul style="list-style-type: none">• MAQ-SOW-01 (most recent version);• MAQ-SOW-02 (most recent version);• MAQ-SOW-07 (most recent version); and• MAQ-SOW-09 (most recent version); |
| Sample Types: | <ul style="list-style-type: none">• These samples are collected weekly from various stacks around the laboratory during CY 2003.• The filter material is glass-fiber. |
| Analysis Requirements: | <ul style="list-style-type: none">• All glass-fiber filter samples are to be analyzed for the following constituents: Gross alpha/beta and gamma-emitting nuclides.• Detection limit requirements vary and are shown in the SOWs. |
| Screening Data | <ul style="list-style-type: none">• Alpha, beta and gamma screening data are shown on the Chain-of-Custody. |
| Shipping Data: | <ul style="list-style-type: none">• For shipping purposes, we summed the maximum alpha, beta, and gamma screening data and calculated results as nanocuries/gram. |

- Sample Retention
- After instrumental counting, all samples will be retained under full chain-of-custody for subsequent semiannual compositing.

If you require further information please contact me at (505) 665-8866 during working hours or Ernie Gladney at (505) 667-0295 during working hours or at (505) 672-1029 during off hours.

Sincerely

Debra Archuleta
MAQ Meteorology and Air Quality

DA:lrn

Att: Table 1 – Chain of Custody and Screening Data

Cy: Dave Fuehne, MAQ
Ernest S. Gladney, MAQ
MAQ File



To/MS: Tom Houston, BUS-4
From/MS: Debra Archuleta, J978
Phone/Fax: 5-8866/5-8858
Symbol: RRES-MAQ:03-
Date: Mmdd, yyyy

Subject: Particulate Stack Filter Samples **Rxxyyzz** being sent for radioactivity analysis

These air filter samples are being shipped to an analytical laboratory for radioactivity analysis to determine specific levels of gross alpha/beta and gamma activities. These are exhaust stack samples, and are expected to contain only the low-levels radionuclides that pass through the HEPA filtration units. The major isotopes are presently unknown, but the samples might reasonably be expected to contain traces of: U, Be-7, Ra-222 and K-40.

Similar samples have been collected at LANL for the past 25 years. Maximum levels of radioactivity actually observed in previous weekly samples taken during CY 2002 have been used to calculate the maximum radioactivity that could be contained in this shipment:

Maximum activity: 0.3 nanocuries/gram of sample, net weight.

FILTER CLUMPING STRATEGY

In recent history, only a few sample filters have ever had any detectable gamma-emitting radionuclides. However, it is desired to continue gamma spectroscopy on these samples, to ensure that the stacks are monitored for all potentially significant radionuclides.

To keep this level of security but reduce the cost, time, and effort of gamma spectroscopy analyses, the following strategy is adopted for the stack sample filters, similar to that used in the AIRNET samples. A complete description of the statement of work appears in MAQ-SOW-07.

Stacks with low potential for gamma activity will be “clumped” together, in groups of seven filters. Gamma spectroscopy will be conducted on the entire clump, and if the analysis reveals that there is no activity beyond the minimal detected activity, no further action will be taken. Activity of “< MDA” will be reported for each of the nuclides, for each filter in the clump. Activity above the MDA will result in the clump being separated and each counted individually. If one filter is expected to be “hot” (as determined through gross alpha/beta screening), and its gamma spectroscopy analysis reveals that it accounts for all of the initially detected activity in the clump, analysis on the subsequent filters is unnecessary.

Gross alpha and gross beta analysis will be still be conducted on each filter individually. Charcoal filters will still be analyzed individually, as will paper filters from facilities with higher potential for gamma activity.

When submitting samples to HPAL, the samples will be submitted in groups associated by clumps. A single chain-of-custody form will be used for each group as described below.

At the beginning of CY 2002, the following breakdown was used for clumping paper filters. Note that MAQ Rad-NESHAP staff can change the clump groupings if warranted by operational needs.

TA-3 Bldg-29 (Chemical & Metallurgical Research facility), “A” Clump (0300029AC)
These filters have a greater potential for activity than other CMR samples.

TA-03-BLDG-29-ES-23	(Wing 4)
TA-03-BLDG-29-ES-24	(Wing 4)
TA-03-BLDG-29-ES-28	(Wing 5)
TA-03-BLDG-29-ES-29	(Wing 5)
TA-03-BLDG-29-ES-44	(Wing 9, Hot Cells)
TA-03-BLDG-29-ES-45	(Wing 9, Hot Cells)
TA-03-BLDG-29-ES-46	(Wing 9, Hot Cells)

Continued on next page

FILTER CLUMPING STRATEGY, CONTINUED

TA-3 Bldg-29 (Chemical & Metallurgical Research facility), “B” Clump (0300029BC)

These filters have a lower potential for activity than other CMR samples.

TA-03-BLDG-29-ES-14	(Wing 2)
TA-03-BLDG-29-ES-15	(Wing 2)
TA-03-BLDG-29-ES-19	(Wing 3)
TA-03-BLDG-29-ES-20	(Wing 3)
TA-03-BLDG-29-ES-32	(Wing 7)
TA-03-BLDG-29-ES-33	(Wing 7)
TA-03-BLDG-29-ES-37	

The Non-CMR Gamma Clump (NONCMRGC)

These filters are from facilities outside of CMR, with low potential for gamma activity.

TA-03-BLDG-102-ES-22
TA-48-BLDG-01-ES-54
TA-50-BLDG-01-ES-02
TA-50-BLDG-37-ES-01
TA-50-BLDG-69-ES-03
TA-55-BLDG-04-ES-15
TA-55-BLDG-04-ES-16

Non-Clumped filters (individual analyses)

These filters have the highest potential for gamma activity

TA-48-BLDG-01-ES-07
TA-48-BLDG-01-ES-60

Stack Sample Data Form and Chain-of-Custody Record

This form is from MAQ-109

Facility Name: Analysis Requested: Gross Alpha, Gross Beta, Gamma Spectroscopy	Sample System Inspection (Place a check (√) in box to indicate normal operation/conditions. Record sample flow in lpm/units)	Place Barcode Tracking Sticker Here
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Sample Identification TA – Bldg – ES	Date Start	Time Start	Date Stop	Time Stop	Matrix	Container Type	Stack Fan	Sample Flow	Filter House	Sample Line	Stack Con'd	Timer reading	Remarks
					Filter	Glassine Envelope							
					Filter	Glassine Envelope							
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UNSCHEDULED SAMPLE COLLECTION

MAQ, Meteorology and Air Quality Group

UNSCHEDULED SAMPLE COLLECTION

Stack Sample Data Form and Chain-of-Custody Record

This form is from MAQ-109

Facility Name:

Analysis Requested: Gross Alpha, Gross Beta, Gamma Spectroscopy

Sample System Inspection

(Place a check (✓) in box to indicate normal operation/conditions. Record sample flow in lpm/units)

Place Barcode
Tracking Sticker Here

Sample Identification TA – Bldg – ES	Date Start	Time Start	Date Stop	Time Stop	Matrix	Container Type	Stack Fan	Sample Flow	Filter House	Sample Line	Stack Con'd	Timer reading	Remarks
					Filter	Glassine Envelope							
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